Remarks

Claims 1-6 are pending in the application. Claims 1-6 are rejected. All rejections are traversed.

The Examiner objected to claim 4. Claim 4 has been amended. It is extremely well known that the symbol "$\cup$" stands for the union of sets. There is no other meaning for this symbol in mathematics, see for example the high school textbook "Mathematics: Its Power and Utility," Karl J. Smith, Brooks/Cole, 2000.

The invention determines a compactness ratio of a plurality of data sets. As defined in the Application "compactness is a value that generally indicates a spatial arrangement of the data, vectors, or signals that are grouped in a given area or volume. Therefore, a compactness value considers shape characteristics, the uniformity of the spatial distribution, and the density of the closed forms."

By conventional ordinary definition: the ratio of two numbers r and s is written $\frac{r}{s}$, where r is the numerator and s is the denominator. Therefore, for the prior art to anticipate a "compactness ratio" it must describe a numerator *r* with a **union** of compactness values for a plurality of data sets, *and* a denominator *s* of a **sum** individual compactness values of the plurality of data sets.

Claims 1-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Crabtree (U.S. 6295367).

At column 21, lines 1-10, Crabtree describes a single measure of compactness ρ for a single image region. Nowhere does Crabtree describe measuring a compactness value ρ for a **union** "$\cup$" of a plurality of regions.

By conventional ordinary definition: the union of two sets *A* and *B* is the set obtained by combining the members of each. This is written "$A \cup B$", and is pronounced "*A* union *B*" or "*A* cup *B*."

Nowhere, in this cited section, does Crabtree describe how multiple compactness values ρ for a union of the regions are combined into a numerator *r* of a compactness ratio.

Nowhere, does Crabtree describe **summing** individual multiple compactness values for his regions to determine a denominator of a compactness ratio.

Nowhere, does Crab tree describe dividing the sum of the unions of compactness values by the sum of individual compactness values.

At Column 19, line 15-20, Crabtree describes:

> Moment invariants are certain functions of moments which are invariant to geometric transformations such as translation, scaling, and rotation. The following definitions of moments which are invariant under translation are:
>
> $$\mu(i, j) = \frac{1}{N} \sum_{x,y} (x - \bar{x})^i (y - \bar{y})^j$$

The moment invariants described by Crabtree in the citation by the Examiner have nothing to do with compactness ratio. Applicant respectfully requests a clarification why moment invariants anticipate the invention.

The Applicant has considered columns 19 through 24 in detail, and cannot find anything to do with a compactness ratio of any kind. Applicant respectfully requests the Examiner to point out which equation is a ratio of any kind, let alone a compactness ratio. The Examiner states that these columns teach "the broad limitations of the invention."

MPEP 707.07(f) mandates that "where a major technical rejection is proper, it should be stated with a *full development of the reasons* rather than by a *mere conclusion* coupled with some stereotyped expression." MPEP 2131 explicitly states that in order to anticipate a claim "each and every element as set forth in the claims" must be found in the prior art reference." The rejection by the Examiner is a mere conclusion, without a full development of reasons.

Applicant firmly asserts that none of the limitations in claim 1 are described by Crabtree.

Crabtree compactness value: perimeter squared divided by area.
Claimed compactness value: area divided by border squared.

The sections cited by the Examiner in column 19 have nothing to with a compactness **ratio.** There, Crabtree describes *moment features* and *elongation.*

Nowhere does Crabtree describe the union of anything.

The Examiner cites column 27, lines 34-37:

“

In step **760**,the confidence values for every connected component in the region cluster are combined (by addition, selecting a maximum value, or some other method) to form the final confidence for the region cluster. ”

as anticipating “combining the pair of data sets having a maximum compactness ratio.”

Applicants can only see that *confidence values* are combined to form a final confidence for a region cluster. At column 6, Crabtree defines:
“a confidence value for each region that represents a *likelihood* that the region represents an object to be tracked.”

The confidence of a likelihood of tracking an object is not a compactness ratio of an object. With all due respect, the Examiner’s interpretation is clearly erroneous.

Claims 3-4 are rejected under 35 U.S.C. 103(e) as being unpatentable over Crabtree (U.S. 6295367).

At column 21, Crabtree describes:

“

Ratio of Maximum Chord Length to Perpendicular Chord

The ratio of the length of a maximum chord of a region cluster to a chord perpendicular to it is a useful contour matching parameter. ”

This seems to say that a ratio of a chord length to a particular chord is a useful *contour matching* parameter. As used by Crabtree a contour, in the ordinary

dictionary meaning is: an outline especially of a curving or irregular figure, also the line representing this outline.

At column 21, Crabtree describes:

"

significant impact on the accuracy of the correspondence process. A simple approach is to use a linear discriminant function of the following form:

$$D(d_1, d_2, \ldots, d_N) = \sum_{i=1}^{N} w_i d_i$$

While this linear classifier is suitable for separable pattern classes, it does not yield the best results in the general non-separable case. To achieve more robust decision boundaries, a quadratic nonlinear classifier of the following ”

and at column 23 Crabtree describes:

"

$$D(d_1, d_2, \ldots, d_N) = \sum_{j=1}^{N} w_{jj} d_j^2 + \sum_{j=1}^{N-1} \sum_{k=j+1}^{N} w_{jk} d_j d_k + \sum_{j=1}^{N} w_j d_j$$

To determine coefficients w_{ij}, an associative unit of intermediate variable s_k is defined such that

$d_i d = S_k$ where $k=i+j$

Then $D(d_1, d_2, \ldots, d_N)$ which is a nonlinear function of d_i variables, becomes a linear function of S_k variables with the same weighting coefficients $w_k = w_{ij}$ where $k=i+j$. Thus,

$$D(s_1, s_2, \ldots, s_N) = \sum_{k=1}^{M} w_k s_k$$

$$M = \frac{(n+1)(n+2)}{2}$$

”

Claimed is:

$$CR_{f_1 \ldots f_M} = M \frac{C_{(f_1 \cup \ldots \cup f_M)}}{C_{f1} + \ldots + C_{fM}}$$

where the numerator is a union of compactness values, and the denominator is a sum of compactness values, and M is a number of data sets.

The sections cited by the Examiner describe a linear discriminant for a classification problem. This has nothing to do with compactness ratios as claimed.

All rejections have been complied with, and applicant respectfully submits that the application is now in condition for allowance. The applicant urges the Examiner to contact the applicant's attorney at phone and address indicated below if assistance is required to move the present application to allowance.

Please charge any shortages in fees in connection with this filing to Deposit Account 50-0749.

Respectfully submitted,

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